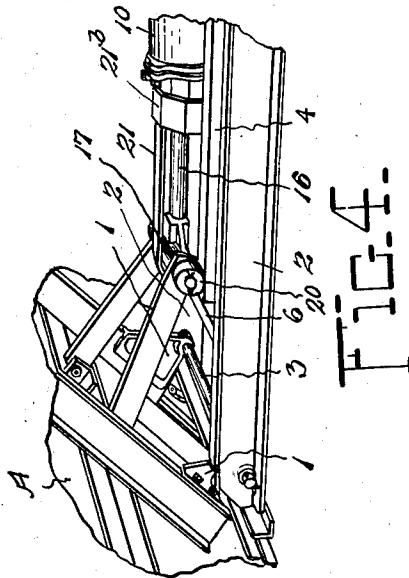
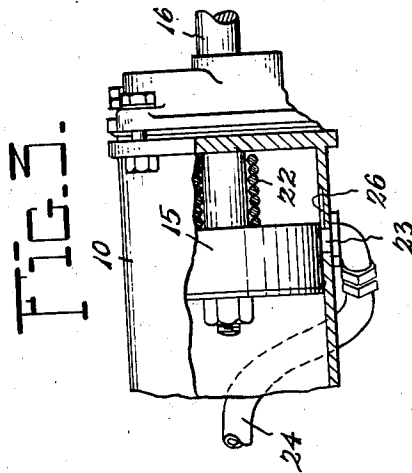
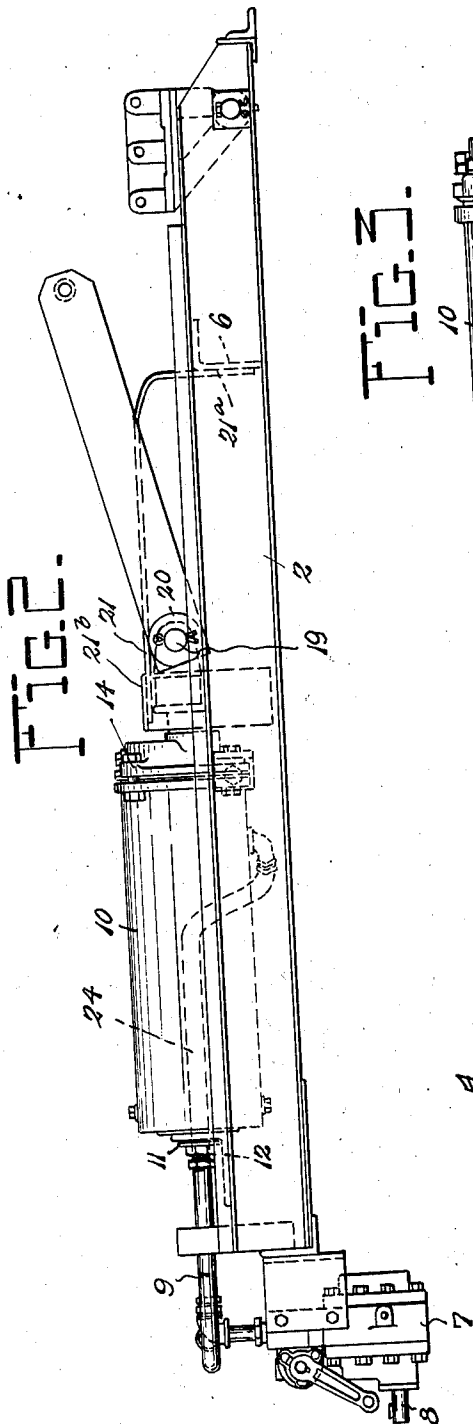


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DUMP BODY HOIST MECHANISM

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Application May 24, 1935, Serial No. 23,302

3 Claims. (Cl. 298—22)

This application is a continuation in part of my co-pending application Serial No. 721,824, filed April 21, 1934, for "Hydraulic hoist for dump bodies".

5 My invention involves certain improvements in hydraulic hoist mechanism of the type which are commonly used today for incorporation in automotive vehicles or trucks for the purpose of lifting dump bodies mounted upon the truck
10 frame.

The special construction of hydraulic hoist employed by me utilizes a cylinder for the reception of the motive fluid, preferably oil, piston means mounted in said cylinder and connected
15 by its piston rod to an operating head exterior to the cylinder, together with linkage connections intermediate said operating head and the body which is to be raised and lowered, whereby the lifting pressure derived from the fluid in the
20 cylinder may be transmitted through the links to the said body for elevating the latter. The operating head according to my construction is equipped with rollers to travel upon tracks or
25 rails mounted on the frame of the vehicle in the back and front movement of the head for the elevating and lowering movements of the body as caused by the link connections therewith.

Involved in my invention is a peculiar arrangement and mounting for the rollers carried by the
30 operating head such that the thrust of the links which converge toward each other at the points of connection with the head will in no way be transmitted to the roller so as to interfere with the freedom of action of the latter in their travel
35 upon the rails or tracks provided therefor.

Another feature of my invention resides in the provision of a combination stop and guide device to cooperate with the operating head which
40 actuates the links by which the body is raised to dumping or tilted position.

Still another feature of my invention resides in the provision in the cylinder of an oil passage associated with the low pressure port of the
45 cylinder. This passage is for facilitating the return or lowering action of the dump body to its normal loading position, after the piston movement has carried the piston to a position closing this low pressure port against the exhaust flow
50 of pressure fluid. Said piston movement is caused by the action of the fluid at high pressure against the working side of the piston, during the elevating movement of the body to its tilting or dumping position.

55 In the accompanying drawings—

Figure 1 is a top plan view showing the general chassis of a truck equipped with the hydraulic hoist mechanism of the invention, the dump body omitted, but the hydraulic mechanism being shown as connected with the lifting or elevating
5 links that are to be attached to the dump body.

Figure 2 is a side elevation of substantially all the parts illustrated in Figure 1.

Figure 3 is a fragmentary sectional view of the rear end of the cylinder, illustrating more clearly
10 the low pressure port and the fluid passage leading therefrom in the direction of the rear cylinder head.

Figure 4 is a fragmentary perspective view showing a portion of the chassis of the truck
15 which carries the dump body, the latter partially illustrated in a fragmentary manner, the view bringing out somewhat more fully the mounting of the guide and stop devices cooperating with the piston head to limit its rearward movement
20 and to prevent dumping of the operating head on the piston rod, with its rollers, off of the roller track where it is normally supported, the said stop and guide members also acting to guide the head in its longitudinal actuating movement.
25

Since the invention is applicable to various types of chassis or frame structures of dumping trucks, the frame construction per se is not a material feature of the invention save as it is combined with the parts of the cylinder, operating head, lifting links, and track arrangements that will be more fully set forth shortly. In the drawings the dumping body illustrated is designated A and may be any one of many different types commonly used. It is pivotally mounted by
35 brackets 1 upon the side members 2 of the main chassis or frame of the vehicle by means of an axis rod 3 or any suitable pivot connections that may be selected or desired. The chassis frame according to this invention may be conventional
40 save and except in respect to the employment of longitudinal rails or track members 4, the said track members being connected at the front of the chassis with a cross member 5 and at the rear portion of the chassis with a cross member 6
45 located some distance in advance of the axis means 3 previously referred to.

At the front portion of the chassis or frame of the vehicle is disposed the pump 7 which may
50 be of a known type adapted to be operated by suitable shaft means partially shown at 8, the latter to be connected with the power take-off adapted to be attached to the truck transmission means, this feature of construction not, however, being a
55

part of the present invention, as previously indicated. From the pump 7 an intake pipe 9 leads to the front end of the cylinder assembly which includes the cylinder 10, said pipe 9 being connected with a coupling supported by a trunnion 11 carried by and rigidly fastened to the head at the high pressure end of the cylinder. The trunnion 11 is hollow so that the pipe line 9 may conduct the oil therethrough into the high pressure end of the cylinder 10, as will be obvious. However, it is notable that the trunnion 11 is substantially concentric with the axis of the cylinder 10 and free to turn in a bearing on the cylinder supporting member 12 which takes the form of an angle plate rigidly mounted upon the front ends of the track members 4 and frame sides 2, the vertical flange of said angle plate having the said bearing formed therein. Thus the high pressure end of the cylinder 10 has a one-point suspension or supporting mounting. At the rear end thereof, the cylinder 10 is carried by special separate brackets 13 fastened to the inner sides of the track members 4 at corresponding outer ends and fastened to the rear cylinder head 14 at their corresponding inner ends, as well seen in Figure 2, the parts 12 and 13 affording a three-point suspension mounting for the cylinder 10.

In the cylinder 10 is mounted the pressure operated piston 15 and this piston has the customary piston rod 16 which projects through the rear end or head 14 of the cylinder and carrying thereon exterior to the cylinder the hollow sleeve-like operating head 17. This operating head 17 is mounted between the lifting links 18 that connect with a roller shaft 19 upon which rollers 20 are mounted, said rollers being free to travel longitudinally of the track members 4. It is notable that the links 18 converge forwardly toward their points of connection with the roller shaft 19 so that the thrust of the said links toward each other is transmitted directly to the crosshead 17 and shaft 19, leaving the rollers 20 entirely free to take care of the vertical component of the thrust action. In other words, there is no tendency on the part of the thrust component of the links 18 to interfere with the free turning of the rollers 20 and the stress set up in the shaft 19 is purely shear as compared with prior devices of this type, wherein the lifting links employed are so attached usually outside of the rollers as to produce bending stresses in the shaft means that corresponds with the shaft 19 of the present invention, not to mention, in addition thereto, disadvantageous thrusts against the ends of the rollers, all of which difficulties are obviated by the present improvements.

Extending rearwardly from the rear end of the cylinder 10 is a combination guide and stop member comprising the guide bar 21 having its rear end fastened in some substantial manner, as by welding, as shown at 21a, to one of the crossbars 6 of the frame or chassis. At its front end the guide member 21 is fastened to a curved supporting plate 21b, transversely arranged relatively to the roller tracks 4 and welded or otherwise fastened at its opposite ends to the inner flanges of said tracks.

The arrangement of the guide member 21 is such that it is in a plane in substantial parallelism with the horizontal plane including the roller faces of the tracks 4 and extends over the crosshead 17 so as to guide the latter back and forth in its movement, and furthermore act with stopping effect in a vertical direction to prevent jumping of the crosshead and its rollers from supporting

relation in respect to the tracks when the dumping body A is being moved upwardly toward its tilted or dumping position. The end 21a of the member 21 acts as a stop to limit the rearward movement of the head 17, in an obvious manner.

Within the cylinder 10 and mounted upon the piston rod 16 at the front side of the piston 15 is a coiled spring 22 which encircles the piston rod. This spring moves rearwardly with the piston 15 and piston rod 16 during the pressure stroke for elevating the dump body A, and the rear end of the spring 22 finally abuts with the head 14 at the rear end of the cylinder 10 and becomes compressed during the final movement of the dump body A in reaching its dumping limit of travel. Since the weight of the dump body is not always sufficient to start the body back to its original or lowered normal position when the cylinder pressure in the cylinder 10 is relieved, it will be seen that the compressed spring 22 performs an actuating function upon relief of said pressure such as will tend to force the piston 15 forwardly as soon as the lifting pressure is released.

By reason of the three-point suspension or mounting of the cylinder assembly described, it is evident that strains will not be set up in the cylinder assembly by reason of any weaving or distortion of the truck frame in the practical use of the device of the invention.

The movement of the piston 15 in the cylinder is compelled by the admission of fluid at high pressure into the front end of the cylinder through the high pressure line 9. The fluid under pressure acts upon the front side of the piston 15 and forces the same rearwardly, communicating similar movement to the piston rod 16, to the operating head 17, and to rollers 20; also to the links 18. During this rearward movement of the piston 15 the oil or pressure fluid at the rear side of the piston 15 in the cylinder 10 is caused to pass from the cylinder through the low pressure line 24, being admitted to the latter through the low pressure port 23 located near the rear end of the cylinder 10. When the piston 15 reaches a point in its rearward movement such that it substantially covers entirely the low pressure port 23, there is accomplished substantially a cutting off of the exhaust of the pressure fluid through the low pressure line or pipe 24, and a stopping of the upward travel of the dumping body A as it reaches its final dumping position is accomplished in this way. At this time the spring 22 is compressed fully between the piston 15 and the rear end of the cylinder 10. There is provided, see Figure 3, near the rear end of the cylinder 10 an oil groove or passage 26, preferably in the bottom wall of the cylinder 10 and leading a short distance rearwardly from the low pressure port 23 toward the rear end of the cylinder. Thus when the high pressure of the fluid in the high pressure pipe or line 9 leading to the front end of the cylinder is released, the inertia and/or weight of the dumping body A and the spring 22 will tend to force the piston 15 toward the front end of the cylinder, and this action is facilitated, for the purpose of lowering the dumping body A, by the provision of an oil or fluid passage 26, which, under such conditions, permits a small quantity of the oil, now required to be carried through the low pressure line 24 and port 23 into the cylinder 10 in rear of the piston 15, to pass into the cylinder so that the piston 15 will move forwardly slowly at first under the influence of said inertia and weight and spring and the retarded

entrance of the oil from the low pressure line 24 and port 23 and the passage 26. When, however, the forward movement of the piston 15 has caused the same to clear the port 23 previously covered thereby, the back-flow of the oil through the low pressure line 24 and port 23 will increase in velocity and thereafter the downward movement of the body will be continued at an increased speed. The provision of the groove or passage 26 prevents a locking of the body in its upward or final dumping position, therefore, due to the complete closing of the low pressure port by the piston 15.

In connection with the foregoing it is to be borne in mind that movement of the piston 15 rearwardly in the cylinder 10 under the action of the high pressure fluid entering through the line 9 requires exit or exhaust of the pressure fluid or oil from the rear side of the piston through the low pressure line 24. Likewise when the high pressure of the fluid in the line 9 is released and the piston 15 is required to move forwardly in the cylinder 10 for lowering of the dumping body, the oil at the front side of the piston 15 is circulated so that it passes out of the cylinder 10 through the high pressure line 9 and re-enters the cylinder 10 at the rear side of the piston 15 through the low pressure line 24 and port 23, and at the preliminary stage of the body lowering operation through the passage or groove 26.

For the control of the passage of the fluid pressure medium to the cylinder 10 at opposite sides of the piston 15 there will be utilized the customary provisions associated with the pump 7, these being immaterial to the invention, however.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a dumping vehicle of the class described, the combination of a dumping body, a chassis supporting said body, means for raising and lowering the body, including link members connected at one end to the body with an operating head movable longitudinally of the chassis and connected with the other ends of the said link members, means for actuating said operating head to move the same in one direction for causing tilting dumping movement of the body and movement in the opposite direction to restore the body to its loading position after dumping, a stop and guide device cooperating with the operating head comprising a guide member extending over the operating head in a direction parallel with the direction of movement of the latter, and intermediate the link members, to prevent upward

movement of the head while permitting movement thereof lengthwise of the chassis, one end of said guide member being extended downwardly for engagement with the operating head to limit its movement in one direction, a crossbar in the chassis to which said downwardly extending portion of the guide member is attached, spaced members on the chassis parallel with the said guide members, and a supporting plate disposed transversely of said spaced members and secured thereto and to the end of the guide member opposite that extended downwardly as above described.

2. In a dumping vehicle, in combination, a dumping body, a chassis on which said body is supported, spaced link members connected with the body at one end, track members on the chassis in spaced relation, an operating crosshead connected with the other ends of the spaced link members, rollers carried by said crosshead and movable on said track members, actuating means for shifting the crosshead longitudinally of the track members whilst the rollers thereon travel on the latter, said chassis including a crosspiece or member, and a guide and stop member comprising a guide member disposed above the crosshead to cooperate therewith to hold the crosshead with its rollers down on the track members said guide and stop member being disposed intermediate the rollers on the crosshead, said guide member being extended at one end downwardly and connected with said crosspiece of the chassis to form a stop for the crosshead, and a transverse supporting member at the other end of the guide member spanning the space between the track members and attached thereto and cooperating to hold the guide and stop member in proper position relative to the crosshead.

3. In a dumping vehicle of the class described, the combination of a dump body, a chassis upon which the dump body is carried, laterally spaced lifting links connected with the dump body for raising and lowering the same and arranged so as to converge forwardly from their connection with the dump body, thereby disposing the forward ends of the links closer together than at the ends which are connected to the dump body, tracks on said chassis, a cross-head connected to said links, rollers on the ends of the cross-head adapted to move on said track, a cylinder having a piston connected to said cross-head and adapted to reciprocate the same, and a stop member disposed intermediate the rollers on the cross-head adapted to prevent vertical movement of the rollers without interfering with their reciprocating movement.

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